

WHAT IS CLAIMED IS:

1. A method for detecting and resolving conflicts in association with a data allocation, comprising:

5 determining the relationship between each of a plurality of positions in a hierarchical organization of data;

selecting a position i ;

determining a total weight of position i ;

10 if a total weight of position i is effectively non-zero, removing the influence of position i from the other positions and adding position i to a set of conflict-free positions;

alternatively, if the total weight of position i is effectively zero:

selecting a position k with which position i has a relationship;

15 reintroducing the effect of position k on the other positions if k is already in the conflict-free set;

removing position k from the conflict-free set if k is already in the conflict-free set; and

if i is not the selected position, removing the influence of position i from the other positions and adding position i to the conflict-free set; and

20 successively repeating the method for each position, with each successive position becoming position i .

2. The method of Claim 1, wherein:

the positions comprises parents in the hierarchical organization of data and positions i and j comprise parents i and j ; and

25 determining the relationship between a plurality of positions comprises determining a parent-parent relationship matrix identifying the relationships between a plurality of parents.

3. The method of Claim 2, wherein the parent-parent relationship matrix
30 is determined using a parent-child relationship matrix identifying the relationships between each parent and one or more children of each parent.

4. The method of Claim 3, wherein the parent-parent relationship matrix comprises the matrix $\mathbf{R}\Sigma\mathbf{R}^T$, where Σ comprises a matrix of the variations of the children, \mathbf{R} comprises the parent-child relationship matrix, and \mathbf{R}^T is the transpose of \mathbf{R} .

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5. The method of Claim 3, wherein the parent-parent relationship matrix comprises the matrix $\mathbf{R}\mathbf{R}^T$, where \mathbf{R} comprises the parent-child relationship matrix and \mathbf{R}^T is the transpose of \mathbf{R} .

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6. The method of Claim 2, wherein determining the total weight of position i comprises identifying the diagonal value in the parent-parent relationship matrix corresponding to parent i .

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7. The method of Claim 6, wherein removing the influence of position i comprises performing a *SWEEP* operation on the diagonal value in the parent-parent matrix corresponding to parent i .

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8. The method of Claim 6, wherein reintroducing the effect of position k on the other positions comprises performing an *INVSWEET* operation on the diagonal value in the parent-parent matrix corresponding to parent k .

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9. The method of Claim 1, wherein selecting position k comprises:
requesting a selection by a user of position k ; and
receiving input from the user identifying the selected position k .

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10. The method of Claim 9, wherein a selection by a user of position k is requested only if position i is included in a pre-defined set of positions for which user input is requested.

11. The method of Claim 1, wherein selecting position k comprises selecting a position having a shared weight with position i that is effectively non-zero.

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12. The method of Claim 1, wherein:
the hierarchical organization of data comprises one or more dimensions; and
the positions are all members of the same dimension within the hierarchical
organization of data.

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13. The method of Claim 1, wherein:
the hierarchical organization of data comprises multiple dimensions; and
the positions are associated with multiple dimensions of the hierarchical
organization of data.

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14. A system for detecting and resolving conflicts in association with a data allocation, the system comprising one or more software components collectively operable to:

- 5 determine the relationship between each of a plurality of positions in a hierarchical organization of data;
- select a position i ;
- determine a total weight of position i ;
- if the total weight of position i is effectively non-zero, remove the influence of position i from the other positions and add position i to a set of conflict-free positions;
- 10 alternatively, if the total weight of position i is effectively zero:
 - select a position k with which position i has a relationship;
 - reintroduce the effect of position k on the other positions if k is already in the conflict-free set;
 - remove position k from the conflict-free set if k is already in the
- 15 conflict-free set; and
 - if i is not the selected position, remove the influence of position i from the other positions and add position i to the conflict-free set; and
 - successively repeat the above steps for each position, with each successive position becoming position i .

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- 15. The system of Claim 14, wherein:
 - the positions comprises parents in the hierarchical organization of data and positions i and j comprise parents i and j ; and
 - determining the relationship between a plurality of positions comprises
- 25 determining a parent-parent relationship matrix identifying the relationships between a plurality of parents.

- 16. The system of Claim 15, wherein the parent-parent relationship matrix is determined using a parent-child relationship matrix identifying the relationships
- 30 between each parent and one or more children of each parent.

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17. The system of Claim 16, wherein the parent-parent relationship matrix comprises the matrix $R\Sigma R^T$, where Σ comprises a matrix of the variations of the children, R comprises the parent-child relationship matrix, and R^T is the transpose of R .

18. The system of Claim 16, wherein the parent-parent relationship matrix comprises the matrix RR^T , where R comprises the parent-child relationship matrix and R^T is the transpose of R .

19. The system of Claim 15, wherein determining the total weight of position i comprises identifying the diagonal value in the parent-parent relationship matrix corresponding to parent i .

20. The system of Claim 19, wherein removing the influence of position i comprises performing a *SWEEP* operation on the diagonal value in the parent-parent matrix corresponding to parent i .

21. The system of Claim 19, wherein reintroducing the effect of position k on the other positions comprises performing an *INVSWEET* operation on the diagonal value in the parent-parent matrix corresponding to parent k .

22. The system of Claim 14, wherein selecting position k comprises:
requesting a selection by a user of position k ; and
receiving input from the user identifying the selected position k .

23. The system of Claim 22, wherein a selection by a user of position k is requested only if position i is included in a pre-defined set of positions for which user input is requested.

24. The system of Claim 14, wherein selecting position k comprises selecting a position having a shared weight with position i that is effectively non-zero.

25. The system of Claim 14, wherein:
the hierarchical organization of data comprises one or more dimensions; and
the positions are all members of the same dimension within the hierarchical
organization of data.

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26. The system of Claim 14, wherein:
the hierarchical organization of data comprises multiple dimensions; and
the positions are associated with multiple dimensions of the hierarchical
organization of data.

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27. A method for detecting and resolving conflicts in association with a data allocation, comprising:

determining a parent-parent relationship matrix identifying the relationships between a plurality of parents in a hierarchical organization of data, the parent-parent relationship matrix determined using a parent-child relationship matrix identifying the relationships between each parent and one or more children of each parent;

selecting a parent i ;

determining a total weight of parent i by identifying the diagonal value in the parent-parent relationship matrix corresponding to parent i ;

if the total weight of parent i is effectively non-zero, removing the influence of parent i from the other parents and adding parent i to a set of conflict-free parents;

alternatively, if the total weight of parent i is effectively zero:

selecting a parent k with which parent i has a relationship;

reintroducing the effect of parent k on the other parents if k is already in the conflict-free set;

removing parent k from the conflict-free set if k is already in the conflict-free set; and

if i is not the selected position, removing the influence of parent i from the other parents and adding parent i to the conflict-free set; and

successively repeating the method for each parent, with each successive parent becoming parent i .

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determining a parent-parent relationship matrix identifying the relationships
5 between a plurality of parents in a hierarchical organization of data, the parent-parent
relationship matrix determined using a parent-child relationship matrix identifying the
relationships between each parent and one or more children of each parent;

10 determining a total weight of parent i by identifying the diagonal value in the
parent-parent relationship matrix corresponding to parent i ;

alternatively, if the total weight of parent i is effectively zero:

selecting a parent k with which parent i has a relationship;

removing parent k from the conflict-free set if k is already in the

if i is not the selected position, removing the influence of parent i from

successively repeating the method for each parent, with each